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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,468	04/20/2006	Katsumi Yabusaki	287117US0PCT	7180
22850 7590 04/25/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER ISSAC, ROY P	
			ART UNIT	PAPER NUMBER
			1623	
SHORTENED STATUTORY PERIOD OF RESPONSE		NOTIFICATION DATE	DELIVERY MODE	
3 MONTHS		04/25/2007	ELECTRONIC	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/25/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

## Office Action Summary

**Application No.**

10/576,468

**Applicant(s)**

YABUSAKI, KATSUMI

**Examiner**

Roy P. Issac

**Art Unit**

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/4/06; 4/20/06</u> . | 6) <input type="checkbox"/> Other: ____  |

### **DETAILED ACTION**

This application is a 371 of PCT/JP04/15501 filed 10/20/2004 which claims benefit of provisional application 60/515,698 filed 10/31/2003. Claims 1-8 are currently pending and are examined on the merits herein.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "may be partially carbamidated" and "may by partly carbamidated" renders these claims indefinite. It is not clear whether the cellulose is carbamidated and as such one of ordinary skill in the art would not be apprised of the metes and bounds the claims herein.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pieschel (U.S. Patent No. 6,579,977; PTO-892) in view of Hiroka et. al. (U.S. Patent No. 4,981,515; PTO-892).

Pieschel et. al. discloses a process for producing biosorbents by phosphorylation of cellulose containing materials with phosphoric acid. (Abstract; Example 1, Column 6-7). Pieschell further discloses that phosphate groups and carbamide groups provide very high sorption performances for heavy metals. (Column 6, lines 38-48). Pieschel further discloses the use of the modified cellulose in columns. (Column 6, lines 48-55). Note that columns are considered to be in cylindrical shapes. Pieschell et. al. discloses the invention as useful for removing heavy metals from aqueous solutions.

Pieschell et. al. does not expressly disclose the phosphorylation of Cellulose II and its use as adsorbants for metals or the arrangement of the modified cellulose in water tanks.

Hiroka et. al. discloses a method for producing regenerated cellulose (also known as cellulose II) with high adsorption properties and flame retardant properties. (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use phosphorylated Cellulose II as a metal adsorbing material since Pieschell et. al. discloses a method for phosphorylating cellulose and Hiroka et. al. discloses a method for producing regenerated cellulose with strong adsorption and flame retardant properties. Furthermore, it is considered well within the basic skills of one ordinary skill in the art to modify regenerated cellulose, a large set of commercially

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available products, using the method disclosed by Pieschell to produce regenerated cellulose with adsorbent properties. Furthermore, it would have been obvious to one of ordinary skill in the art to use another polymorph of cellulose, cellulose II to phosphorylate or functionalize with carbamate and use as adsorbants for metals and in columns and bags and in water storage tanks. Furthermore, the recitations "metal-adsorbing material", "metal-adsorbing system" and "anion-adsorbing material" are considered recitations of intended use of the composition. Note that it is well settled that "intended use" of a composition or product, e.g., "a metal-adsorbing system", will not further limit claims drawn to a composition or product, so long as the prior art discloses the same composition comprising the same ingredients in an effective amount, as the instantly claimed. See, e.g., *Ex parte Masham*, 2 USPQ2d 1647 (1987) and *In re Hack* 114, USPQ 161.

One of ordinary skill in the art would have been motivated to phosphorylate cellulose II, a group of regenerated cellulose polymorphs, well known in art and commercially available as well as disclosed by Hiroka et. al., to produce phosphorylated cellulose II and to use it as adsorbants for metals in columns and in water tanks because, Pieschell et. al. discloses a method for phosphorylating cellulose and discloses its use as adsorbants for metals and to remove metals from aqueous solutions and its use in columns, and Hiroka et. al. discloses a method for fire retardant and adsorbent cellulose II.

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Therefore, one of ordinary skill in the art would have reasonably expected that the phosphorylation of cellulose II would have resulted in substantially similar or better effects.

Thus the claimed invention as a whole is clearly prima facie obvious over the combined teachings of the prior art.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clermont et. al. (CA868344; PTO-1449, dated 12/04/06; AO) in view of Pieschel et. al. (U.S. Patent No. 6,579,977; PTO-892).

Clermont et. al. discloses a method for phosphorylation of cellulosic material by reaction with phosphorous pentoxide, a phosphorous oxide. (Page 7, lines 1-5; Pages 3-5, Examples 1-10). Clermont further discloses ion exchange properties for phosphorylated cellulose. (Page 6, Paragraph 2). Metal adsorption is considered an ion-exchange process. Clermont et. al. further discloses the use of mercerized or aged alkali cellulose. (Page 2, Paragraph 2). Note that regenerated cellulose by dissolution

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in alkali is considered cellulose II. Mercerization also involves addition of sodium hydroxide to cellulose, and the resultant cellulose is considered regenerated cellulose or the cellulose II polymorph.

Clermont does not exemplify Cellulose II phosphate or the packing in a column or in a form of a bag or cylinder or its use arrangement in water tank or the carbamidation of cellulose.

The disclosure of Pieschel is discussed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use phosphorylated Cellulose II as a metal adsorbing material since Clermont et. al. discloses the use of phosphorylation of a variety of cellulosic materials including regenerated cellulose to ion-exchange purposes, and Pieschell et. al. discloses a method for phosphorylating cellulose and the advantages of phosphorylation and carbamidation in adsorbance properties. Furthermore, it is considered well within the basic skills of one ordinary skill in the art to modify regenerated cellulose, a large set of commercially available products, using the method disclosed by Pieschell to produce regenerated cellulose with adsorbent properties. Furthermore, it would have been obvious to one of ordinary skill in the art to use another polymorph of cellulose, cellulose II to phosphorylate or functionalize with carbamidate and use as adsorbants for metals and in columns and bags and in water storage tanks. As noted above, the recitations "metal-adsorbing material", "metal-adsorbing system" and "anion-adsorbing material" are considered recitations of intended use of the composition.

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One of ordinary skill in the art would have been motivated to phosphorylate cellulose II, a group of regenerated cellulose polymorphs, well known in art and commercially available products, to produce phosphorylated cellulose II and to use it as absorbants for metals in columns and in water tanks because, Clermont and Pieschell et. al. discloses a method for phosphorylating cellulose and discloses its use as absorbants for metals and to remove metals from aqueous solutions and its use in columns.

Therefore, one of ordinary skill in the art would have reasonably expected that the phosphorylation and carbamation of cellulose II would have resulted in substantially similar or better effects.

Thus the claimed invention as a whole is clearly prima facie obvious over the combined teachings of the prior art.

No Claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roy P. Issac whose telephone number is 571-272-2674. The examiner can normally be reached on 9:00-5:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Roy P. Issac  
Patent Examiner  
Art Unit 1623  
April 28, 2006

 4/19/07  
S. Anna Jiang, Ph.D.  
Supervisory Patent Examiner  
Art Unit 1623